# EXHAUST PRESSURE RESTRICTION DEVICE WITH BYPASS PASSAGEWAY

## Abstract of the Disclosure

An exhaust pressure restriction device with bypass passageway is provided. The device comprises a turbocharger having a turbine portion, a restrictor fitting and a bypass fitting. The turbine includes an exhaust gas inlet, a turbine wheel, an exhaust gas outlet and a waste gate valve. The restrictor fitting comprises an exhaust gas inlet, an exhaust gas outlet and an orifice disposed between the exhaust gas inlet and the exhaust gas outlet. The restrictor fitting is mated to the turbine such that the exhaust inlet of the restrictor fitting communicates with the exhaust outlet of the turbine. The bypass fitting has an exhaust gas inlet, an exhaust gas outlet, and a bypass passageway. The exhaust gas outlet of the bypass fitting is adapted to communicate with the exhaust system of the vehicle and to be matingly fitted to both the restrictor fitting and the turbine. The exhaust gas inlet of the bypass fitting communicates with the exhaust gas outlet of the restrictor fitting, while the bypass passageway communicates with the waste gate of the turbine. The exhaust inlet of the turbine is connected to the exhaust manifold of an internal combustion engine. In operation during the peak torque condition of the engine the waste gate valve is closed so that all exhaust gases engage the turbine wheel, the gas then exits the turbine at the exhaust outlet through the orifice of the restrictor fitting and out the exhaust outlet of the bypass fitting. Because the waste gate is closed no gas is allowed to bypass the restrictor orifice. The size of the orifice is selected to create enough back pressure at the peak torque condition to attain the desired level of negative delta P necessary to drive EGR. As the speed of the engine increases the waste gate valve opens allowing a portion of the exhaust gases to bypass the turbine wheel. This gas is then also routed around the restrictor orifice via the bypass passageway thereby lowering the back pressure because the waste gated gases are not subject to the flow restriction caused by the restrictor fitting. Thus negative delta P at rated speed is reduced so as to improve fuel economy at this critical operating point while still maintaining a level adequate to drive EGR.